

CONTENTS

13.	WAG 10, OU 10-04, STF-01, STF-601 SUMPS AND PITS.....	13-1
13.1	Site Description	13-1
13.2	Previous Investigations.....	13-1
13.3	Nature and Extent of Contamination.....	13-1
13.4	Preliminary Screening	13-3
13.5	Risk Assessment.....	13-3
13.5.1	Human Health.....	13-3
13.5.2	Ecological.....	13-3
13.5.3	Native American.....	13-3
13.6	Uncertainties.....	13-3
13.7	Conclusions and Recommendations.....	13-3

FIGURE

13-1.	Location of STF-01 and STF-02.....	13-2
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13. WAG 10, OU 10-04, STF-01, STF-601 SUMPS AND PITS

13.1 Site Description

The D&D (now D&D&D) group discovered flooded sumps and pits upon opening an area of the Security Training Facility (STF) basement that had been sealed since approximately 1984 (Figure 13-1). The site STF-01 was subsequently approved by DOE-ID for addition to OU 10-04 via the New Site Identification (NSI) process. Radiological Control Technicians completed preliminary surveys with hand-held detectors. The preliminary surveys indicated that there was no radionuclide contamination that required posting. Water levels had fluctuated in the sumps and pits as evident from watermarks on the walls. (Laborers entered the subbasement on November 20, 1997, to paint the high watermark on the walls.) Asbestos-bearing materials within the subbasement included plastered walls and thermally insulated piping systems in deteriorated condition. During D&D of the building, it was noted that surface water ponded in an area west of STF-671 where outbuildings were previously removed. There were noticeable whirlpools where stubbed-up piping remained. The stubbed-up piping discharged into the STF subbasement.

13.2 Previous Investigations

The D&D sump and pit sampling began May 19 and ended May 28, 1998. The samples were analyzed for metals, SVOCs, VOCs, asbestos, polychlorinated biphenyls (PCBs), and radionuclides. Validated laboratory results were received in July and September 1998. The Hazardous Waste Determination was prepared September 30, 1998, and the determination was that the water/sediment contained asbestos at 0.08 million fibers per liter (MFL) to less than 6.2 MFL. The drinking water standard for asbestos is 7 MFL. The sediment had Cs-137 concentrations that were within the background of 0.82 pCi/g. No other contaminants were found in the sample analysis.

On May 13, 1999, a filtered pumping station was located onsite, and the sump and pit water was pumped out. The work document for this effort was Work Order Package 11340. Approximately 14,500 gallons of sump and pit water were removed on May 13, and an additional 35,000 gallons were removed on May 14. The water was pumped through a 5-micron filter and discharged to the storm water collection system. It was reported that the pumping had to be repeated on two or three occasions because of storm water runoff collecting and entering the building through abandoned piping systems. Sediment sampling after dewatering determined that the sediment contained less than 1% asbestos, so it was collected and disposed of at the CFA landfill.^a

13.3 Nature and Extent of Contamination

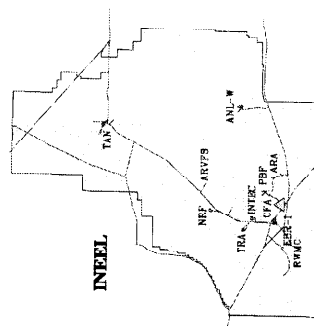
After filtering, the water contained asbestos at levels below the federal drinking water standard, and was discharged to the storm water collection system. The sediments were collected and placed in the CFA landfill because they contained less than background activities for all radionuclides and had no other detected contamination. The demolition was complete by January 2001.

a. Jeffrey Allen, BBWI and former D&D field team leader at STF-601, telephone conversation with Lorin Clements, Portage Environmental, Inc., September 13, 2000.

Security Training Facility (STF)

LEGEND

- Roads and Buildings
- Ditches
- Fences
- Dirt Berms
- Kickout Grid Area (20'X20' Cell Size)
- STF-01
- STF-601 Sumps and Pits
- EOCR-01
- EOCR Leach Pond
- STF-02
- STF Gun Range



△ Vicinity Map

0 120 240 360 Feet

Date Drawn: November 08, 2000

(project\morken\site_001_00_and_kickout_area.dwg)

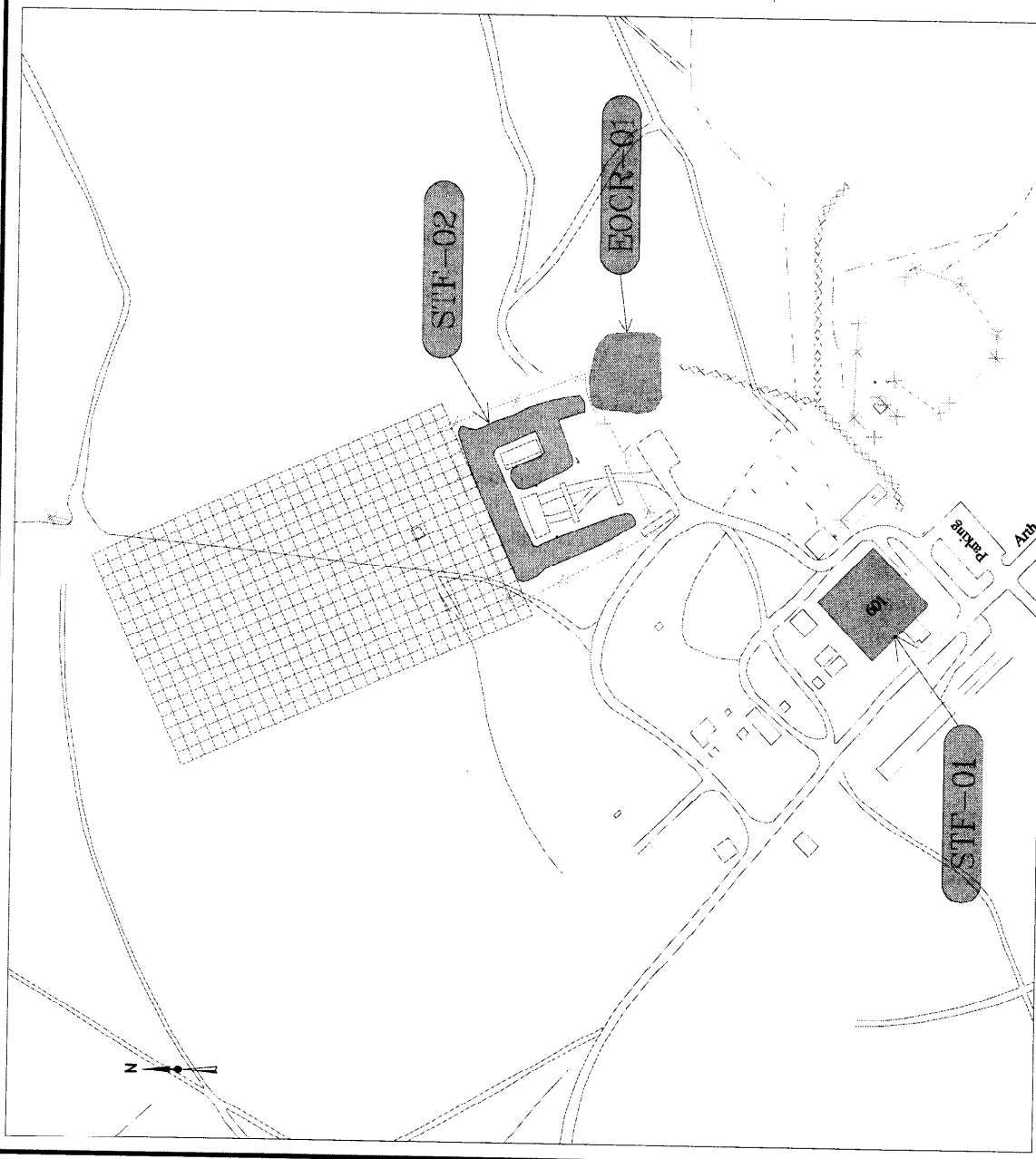


Figure 13-1. Location of Security Training Facility sites.

13.4 Preliminary Screening

Because no contaminants of potential concern have been identified for this site, preliminary screening was not necessary.

13.5 Risk Assessment

13.5.1 Human Health

No HHRA was performed for this site.

13.5.2 Ecological

No ERA was performed for this site.

13.5.3 Native American

The INEEL is within the aboriginal territories of the Shoshone-Bannock Tribes. A wide variety of natural and cultural resources and areas that directly reflect tribal cultural heritage and native landscape ecology are preserved there. These resources are important in maintaining tribal spiritual and cultural values and activities, oral tradition and history, mental and economic well being, and overall quality of life. Appendix A contains a qualitative analysis of WAGs 6 and 10 prepared by the Tribal Risk Assessment Committee.

Although the tribal report (Appendix A) contains no specific reference to tribal concerns at the STF facility, the recent D&D of the building and lack of contamination identified within the minimal structures that remain indicate that this site may be less of a concern than other contaminated areas. However, modern disturbances are also viewed as problematic in the tribal view. Additional steps to restore the area to a semblance of the original sagebrush steppe landscape will go even further to address these tribal concerns and values. Other release sites in the vicinity of the old STF facility do exhibit contamination that probably will be of concern to the Tribes. A summary of these perceived risks is provided in Section 14.7.3.

13.6 Uncertainties

An uncertainty analysis is not applicable because no risk assessment was performed.

13.7 Conclusions and Recommendations

The contaminated media from this site was removed during D&D activities. No COPCs remain in this area, and risk assessments for human health and ecological receptors was not needed. Therefore, this site is recommended for no further action and will not be evaluated in the feasibility study.

CONTENTS

14.	WAG 10, OU 10-04, STF-02, STF Gun Range.....	14-1
14.1	Site Description	14-1
14.2	Previous Investigations and Remediations	14-1
14.3	Nature and Extent of Contamination	14-1
	14.3.1	Kickout Areas 14-1
	14.3.2	Remainder Area 14-2
14.4	Preliminary Screening	14-3
	14.4.1	Kickout Area 14-3
	14.4.2	Remainder Area 14-3
14.5	Risk Assessment.....	14-3
	14.5.1	Human Health 14-4
	14.5.2	Ecological 14-4
	14.5.3	Native American 14-9
14.6	Uncertainties.....	14-9
14.7	Conclusions and Recommendations.....	14-9
14.8	References	14-10

TABLES

14-1.	Summary Exposure Point Concentrations for STF-02 (concentration units are mg/kg or pCi/g; bin depths are in feet).	14-3
14-2.	Summary of ERA HQs for the Kickout Area	14-4
14-3.	Soil contaminant screening process for WAG 10, OU 10-04, STF-02 (Kickout-2000).....	14-6
14-4.	Soil contaminant screening process for WAG 10, OU 10-04, STF-02 (Remainder-2000).....	14-6
14-5.	Summary of ERA HQs for the Remainder Area.....	14-8

14. WAG 10, OU 10-04, STF-02, STF GUN RANGE

14.1 Site Description

The STF area has been used since 1983 for security force practice maneuvers including small arms target practice in a berm approximately 76 m (250 ft) northeast of the former STF-601. The berm was used from approximately 1983 to 1990. Approximately five million rounds were fired into the berm, including tracer rounds. None of the lead bullets that were fired into or that ricocheted away from the berm into the “kickout” areas have been picked up. Kickout is a term used to describe the ricocheted effects of lead bullets. Approximately 61 tons of lead and 3.4 tons of copper may be present (Elliot 2000). Smoke bombs and practice grenades were discharged into the outlying training areas outside the soil impact berms. Gun-cleaning solvent may have been used in this area as well. No radionuclide contamination is anticipated. The DOE-ID approved the NSIF to add the Gun Range and surrounding soils in OU 10-04 as site STF-02 (see Figure 19-2) (DOE-ID 1999).

14.2 Previous Investigations and Remediations

Sampling of the Gun Range berm and surrounding soils was originally planned as part of the OU 10-04 remedial investigation sampling as described in a 1998 field sampling plan (FSP); however, those field activities were never conducted. Sampling at the Gun Range was instead conducted in 2000 according to the FSP (Elliott 2000).

14.3 Nature and Extent of Contamination

Two larger areas of concern were identified following the field sampling, and the results from the areas mentioned above were grouped for risk assessment purposes as follows:

- Kickout—Two kickout areas, 1 and 2
- Remainder—Included berms 1 through 6, inside the range between the berms, the area around EOCR leach pond, the sand area, and the shooting house.

14.3.1 Kickout Areas

Soil samples were collected at two depth intervals, 0 to 0.15 m (0 to 0.5 ft) and 0.15 to 0.45 m (0.5 to 1.5 ft). The maximum detected concentrations were all associated with the 0 to 0.15 m (0- to 0.5-ft) interval. The results are summarized as follows:

- The maximum arsenic concentration (6.3 mg/kg) was only slightly above the INEEL background (5.8 mg/kg). Concentrations are within the regional background ranges discussed in Appendix K.
- The maximum copper concentration (23.2 mg/kg) was also slightly elevated above background (22 mg/kg).
- Lead in soil was elevated with the maximum of 70.2 mg/kg, which was above background (17 mg/kg) and the EBSL. There were 13 other lead values above background ranging from 17.1 mg/kg to 36.2 mg/kg.

- Four of 20 manganese results were above the INEEL background (490 mg/kg) with a maximum concentration of 530 mg/kg.
- Only two selenium detections were found in 20 samples, with a maximum concentration of 0.48 mg/kg, which is elevated relative to background (0.22 mg/kg). However, no Hazard Quotients (HQs) exceeded 10 for ecological exposure, and the concentration also falls below the RBC for Region IX/III human health and does not pose a risk.

14.3.2 Remainder Area

Soil samples were collected at two depth intervals, 0 to 0.15 m (0 to 0.5 ft) and 0.15 to 0.45 m (0.5 to 1.5 ft). There were 51 samples and a field duplicate. For the maximum detected concentrations, only selenium and sodium were associated with the 0 to 0.15 m (0- to 0.5-ft) depth interval. All remaining maxima occurred in the 0.15 to 0.45 m (0.5 to 1.5 ft) depth range. The results are summarized as follows:

- Antimony was detected in five of 22 valid sample results with all positive results located in the berm area 2. The antimony concentrations ranged from 1.5 mg/kg to 14.9 mg/kg compared to the background value of 14.8 mg/kg.
- Arsenic exceeded background in 35 of 52 samples with a maximum concentration of 8.7 mg/kg compared to the background of 5.8 mg/kg. Concentrations are within the regional background ranges discussed in Appendix K.
- Cadmium was detected in four of 52 samples with a maximum concentration (19.8 mg/kg) occurring in the area of the EOCR leach pond. The other three detects were at or below background (2.2 mg/kg).
- Lead had 44 valid sample results with concentrations ranging from 2.9 mg/kg to 24,400 mg/kg. The INEEL background level is 17 mg/kg and 32 values exceeded this concentration with the highest values occurring at berm 2. The other sublocations within this remainder area all had lead levels significantly elevated with respect to background.
- Selenium was detected in nine of 52 samples with concentrations ranging from 0.45 mg/kg to 0.66 mg/kg relative to a background value of 0.22 mg/kg. All elevated selenium values were located in berms 1 through 3 or inside the range between the berms.
- Thallium was detected in only one of 52 sample results with a maximum concentration of 0.9 mg/kg compared to background (0.43 mg/kg), which occurred inside the range between the berms.
- Zinc concentrations ranged from 19.7 mg/kg to 422 mg/kg with the maximum value occurring at the EOCR leach pond area. There were 46 valid sample results for evaluation. Besides the maximum, only two results exceeded background (150 mg/kg) and were associated with berm 2 (225 mg/kg) and the EOCR leach pond (254 mg/kg).

As expected, lead contamination appears widely distributed with significantly elevated concentrations. The other metal contaminants do not greatly exceed background concentrations.

14.4 Preliminary Screening

The soil data collected from 2000 field sampling effort were screened for COPCs. The COPCs resulting from that screening are presented in Table 14-1. The complete screening tables are contained in Appendix C. The human health risk assessment (HHRA) and ecological risk assessment (ERA) screening methodology are discussed in Section 4 and presented in detail in Appendices D and F, respectively.

14.4.1 Kickout Area

At the kickout area, no analytes were retained as COPCs for the HHRA. Copper, lead, and selenium were retained as COPCs for the ERA because the maximum concentrations exceeded the EBSLs.

14.4.2 Remainder Area

For the remainder of the area, lead was retained as an HHRA COPC because the maximum concentration exceeded the RBC. Antimony, lead, selenium, and zinc were retained as COPCs for the ERA because the maximum concentrations exceeded the EBSLs.

14.5 Risk Assessment

Table 14-1 presents the exposure point concentrations for STF-02. Appendix C contains both summary statistics and exposure point concentrations.

Table 14-1. Summary Exposure Point Concentrations for STF-02 (concentration units are mg/kg or pCi/g; bin depths are in feet).

COPC	0-0.5 ft	0-4 ft	0-10 ft
<u>STF-02 Kickout Area</u>			
Copper	2.11E+01	2.63E+00	1.05E+00
Lead	2.67E+01	3.34E+00	1.34E+00
Selenium	2.74E-01	3.42E-02	1.37E-02
<u>STF-02 Remainder</u>			
Antimony	1.49E+01	2.84E+00	1.13E+00
Copper ^a	5.42E+01	2.35E+01	9.40E+00
Lead	2.44E+04	4.18E+03	1.67E+03
Selenium	2.67E-01	3.99E-01	1.60E-01
Zinc	1.09E+02	6.68E+01	2.67E+01

a. Two sample results for copper were removed, according to "hot spots," before the EPCs were calculated for the EPA. See discussion in the summary section for STF-02 remainder area in Appendix F.

14.5.1 Human Health

The total estimated carcinogenic risk for potential future residents, current occupational workers, and future occupational workers at STF-02 cannot be determined because cancer slope factors are not available for lead. No HHRA was performed for this site. The Integrated Exposure Uptake Biokinetic (IEUBK) model, or the methodology presented by the EPA Technical Workgroup for Lead (EPA 1996), could be used to evaluate the potential of adverse health effects from lead. However, because the maximum concentration is more than six times greater than the screening level of 400 mg/kg given in EPA guidance (EPA 1994), it is determined that an unacceptably high potential exists for adverse health effects under a residential scenario. Therefore, this site will be retained in the feasibility study (FS) for remediation.

14.5.2 Ecological

The ERA for STF-02 consisted of two areas: Kickout Area and Remainder Area. Only COPCs with HQs greater than 10 will be retained for further evaluation in the ERA. These HQs and COPCs are presented in Tables 14-2 to 14-5. The COPCs with HQs less than or equal to 10 are eliminated from the ERA because they pose a low risk to ecological receptors and no longer need to be evaluated. Risks from exposure to contaminants at STF-02 could not be evaluated for reptiles, amphibians, and invertebrates because of the lack of toxicity data to develop toxicity reference values. Ecological risks posed by the remaining COPCs are discussed in greater detail under each area listed below.

14.5.2.1 Kickout Area. The HQs for the COPCs from this area ranged from 1 to 20, as shown in Table 14-2.

Table 14-2. Summary of ERA HQs for the Kickout Area

COPCs Receptors	Copper HQs	Lead HQs	Manganese HQs
Deer mouse	5	—	9
Loggerhead shrike	—	2	—
Mourning dove	—	—	2
Mule deer	—	—	1
Plants	—	—	9
Pygmy rabbit	3	—	20 ^a
Sage sparrow	—	2	—
Townsend's western big-eared bat	6	—	—

COPCs with HQs less than one are not presented in this table.

a. See the bulleted discussion on manganese below as to why this COPC was not retained in the ERA.

The ecological risks posed by each of the COPCs at STF-02 Kickout Area are discussed below:

- The HQs for exposure to copper ranged from 3 for the pygmy rabbit (M122A), and 5 for the deer mouse (M422), to 6 for the Townsend's western big-eared bat (M210A). The exposure point concentration is 21.1 mg/kg in the surface soil and 1.05 mg/kg in the subsurface soil. The INEEL background concentration for copper is 22 mg/kg. Therefore, an average species may be exposed to the same magnitude of risk from exposure to background. This contaminant was eliminated as a COPC, because the HQ fell below 10, which indicates a low risk to ecological receptors.
- The only HQs > 1 for exposure to lead was a 2 for the loggerhead shrike (AV322) and the sage sparrow (AV222). The EPC is 26.7 mg/kg in the surface soil and 1.3 mg/kg in the subsurface soil. The INEEL background concentration for lead is 17 mg/kg.
- The HQs for exposure to manganese were 1 for the mule deer (M122), 2 for the mourning dove (AV122), 9 for the deer mouse (M422) and plants (all vegetation), to 20 for the pygmy rabbit (M122A). The EPC in the surface soil is 474 mg/kg decreasing to 23.7 mg/kg in the subsurface soil. The INEEL background for manganese is 490 mg/kg. Therefore, a receptor maybe exposed to the same magnitude of risk from exposure to background. The only receptor with an HQ greater than 10 from exposure to this contaminant was the pygmy rabbit. The EPC for this contaminant represents an overly conservative value due to exposure modeling using weighted averages and, therefore, may result in overestimated risk to ecological receptors. Therefore, risk from exposure to manganese contamination is not considered significant and will no longer be evaluated.
- Selenium HQs at the STF Gun Range Berm Kickout Area 2 were all below 1.0.

The risk evaluation indicates that STF-02 Kickout Area has limited risk to ecological receptors from exposure to soil at the site. No COPCs were retained for further evaluation in the ERA. Complete ERA results are presented in Appendix F.

14.5.2.2 Remainder Area. The HQs for the COPCs from this area ranged from 1 to 2,000, as shown in Table 14-5. Risks to birds could not be assessed for threats from exposure to antimony.

The ecological risks posed by each of the COPCs at the Remainder Area are discussed below.

- The HQs for exposure to antimony ranged from two for the deer mouse (M422) to four for the Townsend's western big-eared bat (M210A). The exposure point concentration is 14.9 mg/kg in the surface soil and 1.13 mg/kg in the subsurface soil. The INEEL background concentration for antimony is 4.8 mg/kg. This contaminant was eliminated as a COPC because the HQs were below 10, which indicates a low risk to ecological receptors.
- The HQs for exposure to copper ranged from two for the sage sparrow (AV222), seven for the pygmy rabbit (M122A), to 10 for the deer mouse (M422) and Townsend's western big-eared bat (M210A). The exposure point concentration is 54.2 mg/kg in the surface soil and 9.4 mg/kg in the subsurface soil. The INEEL background concentration for copper is 22 mg/kg. Two "hot spot" samples were removed from the data set before the exposure point concentrations were calculated (see discussion in Appendix F). This contaminant was eliminated as a COPC because the HQs were equal to or fell below 10, which indicates a low risk to ecological receptors.

Table 14-3. Soil contaminant screening process for WAG 10, OU 10-04, STF-02 (Kickout-2000).

Detected Contaminants	Max. Source Concentration (mg/kg or pCi/g)	Step 1		Step 2	Step 3		Step 4		Site COPC?	
		INEEL Background Concentration (mg/kg or pCi/g)	Max. Concentration > Background?	Nontoxic Metal?	Region 9/3 RBC (mg/kg or pCi/g)	Max. Concentration > RBC?	INEEL EBSL (mg/kg or pCi/g)	Max. Concentration > EBSL?	HHRA	ERA
Copper	23.2	2.20E+01	Yes	No	2.90E+03	No	2.11E+00	Yes	No	Yes
Lead	70.2	1.70E+01	Yes	No	4.00E+02	No	9.94E-01	Yes	No	Yes
Manganese	530	4.90E+02	Yes	No	1.60E+03	No	1.05E+01	Yes	No	No ^a
Selenium	0.48	2.20E-01	Yes	No	3.91E+02	No	1.72E-01	Yes	No	Yes

Source: Waste Area Group (WAG) 10, OU 10-04 Database.

"NA" in Step 1 indicates that a background value is not available.

"No RBC" indicates that an Environmental Protection Agency (EPA) Region 9 or 3 risk-based concentration based on residential soil ingestion is not available.

"No EBSL" indicates that an INEEL ecologically based screening level is not available.

Arsenic was removed from the ERA & HHRA COPC lists because detected levels are within the arsenic regional background ranges discussed in Appendix K.

a. Manganese was eliminated as a COPC for the ERA because only one sample out of 20 exceeded the INEEL background value. The next highest detect was 489 mg/kg.

Table 14-4. Soil contaminant screening process for WAG 10, OU 10-04, STF-02 (Remainder-2000).

Detected Contaminants	Max. Source Concentration (mg/kg or pCi/g)	Step 1		Step 2	Step 3		Step 4		Site COPCs?	
		INEEL Background Concentration (mg/kg or pCi/g)	Max. Concentration > Background?	Nontoxic Metal?	Region 9/3 RBC (mg/kg or pCi/g)	Max. Concentration > RBC?	INEEL EBSL (mg/kg or pCi/g)	Max. Concentration > EBSL?	HHRA	ERA
Antimony	14.9	4.80E+00	Yes	No	3.13E+01	No	1.35E+00	Yes	No	Yes
Copper	1230	2.20E+01	Yes	No	2.90E+03	No	2.11E+00	Yes	No	Yes
Lead	24400	1.70E+01	Yes	No	4.00E+02	Yes	9.94E-01	Yes	Yes	Yes
Selenium	0.66	2.20E-01	Yes	No	3.91E+02	No	1.72E-01	Yes	No—	Yes
Zinc	422	1.50E+02	Yes	No	2.35E+04	No	3.29E+00	Yes	No—	Yes

Source: WAG 10, OU 10-04 Database.

"NA" in Step 1 indicates that a background value is not available.

"No RBC" indicates that an EPA Region 9 or 3 risk-based concentration based on residential soil ingestion is not available.

"No EBSL" indicates that an INEEL ecologically based screening level is not available.

Arsenic was removed from the ERA & HHRA COPC lists because detected levels are within the arsenic regional background ranges discussed in Appendix K.

Thallium was removed from the ERA COPC list because there was only 1 detect in 52 samples (Frequency of Detection Rule, RAGS)

Cadmium was removed from the ERA COPC list because there was only 1 detect in 52 samples (Frequency of Detection Rule, RAGS)

Table 14-5. Summary of ERA HQs for the Remainder Area.

COPCs ^a Receptors	Antimony HQs	Copper HQs	Lead HQs	Zinc HQs
Black-billed magpie	—	—	100	—
Burrowing owl	—	—	200	—
Deer mouse	2	10	300	1
Ferruginous hawk	—	—	2	—
Loggerhead shrike	—	—	900	1
Mourning dove		—	20	1
Plants	—	—	10	3
Pygmy rabbit		7	20	1
Sage sparrow	—	2	2000	8
Townsend's western big-eared bat	4	10	300	—

a. COPCs with HQs less than one are not presented in this table.

The HQs for exposure to lead were estimated as follows:

- 2 for the ferruginous hawk (AV322)
- 10 for plants (all vegetation)
- 20 for the mourning dove (AV122) and pygmy rabbit (M122A)
- 100 for the black-billed magpie (AV422)
- 200 for the burrowing owl (AV322A)
- 300 for the deer mouse (M422) and Townsend's western big-eared bat (M210A)
- 900 for the loggerhead shrike (AV322)
- 2,000 for the sage sparrow (AV222).

The exposure point concentration for lead is 24,400 mg/kg in the surface soil and 1,670 mg/kg in the subsurface soil. The INEEL background concentration for lead is 17 mg/kg. This COPC is well above background and poses a risk to eight ecological receptors. It will be retained in the ERA and further evaluated in the FS.

- Selenium HQs at STF-02 Study Area 1 were all below 1.0.
- The HQs for exposure to zinc ranged from one for the mourning dove (AV122), loggerhead shrike (AV322), pygmy rabbit (M122A), and deer mouse (M422), and three for plants (all vegetation), to eight for the sage sparrow (AV222). The exposure point concentration for

zinc is 109 mg/kg in the surface soil and 26.7 mg/kg in the subsurface soil. The INEEL background concentration for zinc is 150 mg/kg. Therefore, an average species may be exposed to the same magnitude of risk from exposure to background. This contaminant was eliminated as a COPC because the HQs were below 10, which indicates a low risk to ecological receptors.

The ecological risk evaluation indicates that the STF-02 Study Area 1 (Remainder) has risk to ecological receptors from exposure to lead. Complete ERA results are presented in Appendix F.

14.5.3 Native American

The INEEL is within the aboriginal territories of the Shoshone-Bannock Tribes. A wide variety of natural and cultural resources and areas that directly reflect tribal cultural heritage and native landscape ecology are preserved on the INEEL. These resources are important in maintaining tribal spiritual and cultural values and activities, oral tradition and history, mental and economic well-being, and overall quality of life. Archaeological sites recorded in the vicinity of STF/OMRE/EOCR reflect a Native American presence at least 9,000 to 10,000 years before the present. The Tribes have clearly indicated their concern for the protection of these resources for a variety of cultural and traditional values.

No tribal concerns about the STF/OMRE/EOCR facility area are detailed in the report prepared by the Tribal Risk Assessment Committee aside from a general indication that contamination and disturbances of land, air, plants, and animals pose a risk to tribal members and their cultural values. Because all contamination is problematic in the tribal view, WAG 10 assumes that any risks that quantitatively exceed thresholds for ecological receptors will also be unacceptable to the Tribes. Retention of the STF Gun Range for further evaluation and possible remediation due to lead contamination will begin the process of addressing these concerns. Ongoing monitoring and periodic reevaluation of low levels of contamination present within the nearby OMRE leach pond will also help to address general tribal concerns and perceived risks.

14.6 Uncertainties

Due to the levels of lead being more than six times greater than the Revised Interim Soil Lead Guidance (EPA 1994) screening level of 400 mg/kg, unacceptable risk is assumed and the potential human health risk from exposure to lead was not quantified. Because toxicity reference values could not be developed for reptiles, amphibians, and invertebrates, the potential ecological effects to these receptors could not be evaluated and ecological risks may be underestimated.

To limit the amount of information repeated in individual uncertainty sections, only the specific uncertainties associated with each site or area will be discussed within its section. General uncertainties associated with the HHRA are in Appendix D; general uncertainties associated with the ERA can be found in Appendix F.

14.7 Conclusions and Recommendations

If left unattended, the large amount of lead and copper at STF-02 could be transported into the environment along various pathways. Therefore, the STF-02 site poses potential human health and ecological risks from exposure to metals in soils and will be evaluated under the FS.

14.8 References

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CONTENTS

15.	WAG 10, OU 10-04, CPP FLY ASH PIT	15-1
15.1	Site Description	15-1
15.2	Previous Investigations.....	15-1
15.3	Nature and Extent of Contamination.....	15-3
15.4	Preliminary Screening	15-3
15.5	Risk Assessment.....	15-3
15.5.1	Human Health.....	15-3
15.5.2	Ecological.....	15-3
15.5.3	Native American.....	15-6
15.6	Uncertainties.....	15-6
15.7	Conclusions and Recommendations.....	15-6
15.8	References	15-7

FIGURE

15-1.	Location of Fly Ash Pit.....	15-2
-------	------------------------------	------

TABLE

15-1.	Soil Contaminant Screening Process for the Fly Ash Pit (2000).	15-4
15-2.	Summary Exposure Point Concentrations for the Fly Ash Pit (concentration units are mg/kg; bin depths are in feet).	15-5
15-3.	Summary of ERA HQs for the Fly Ash Pit.....	15-5

15. WAG 10, OU 10-04, CPP FLY ASH PIT

15.1 Site Description

Fly ash pit CPP-66 was a site at INTEC used for disposal of ash generated by the Coal-Fired Steam Generation Facility (CFSGF). The CFSGF complex is a 230×140 -m (750×450 -ft) enclosure containing several buildings located southeast of the main INTEC security fence. From 1984 until 1999, the CFSGF generated about 1,000 tons of ash per year. This ash was hydrated and placed into CPP-66, located due east of CFSGF. The dimensions of CPP-66 are approximately $245 \times 122 \times 3.5$ m ($800 \times 400 \times 11$ ft). The original ash pit built in 1984 had a capacity of $53,500 \text{ m}^3$ ($70,000 \text{ yd}^3$). In 1991, it was enlarged to a total volume of $92,000 \text{ m}^3$ ($120,000 \text{ yd}^3$). The process residue (ash), consisting of fly ash, bottom ash, calcium carbonate, and calcium sulfate, is mixed with water inside a cement-mixing truck to produce a slurry, hauled to the ash pit, dumped into the pit behind a 0.9-m (3-ft) dike, and allowed to dry.

The fly ash pit is approximately 2.8 ha (7 acres) in size and surrounded by a berm (see Figure 15-1). The bermed area is about 3.1 to 3.7 m (10 to 12 ft) above the natural terrain and is composed of gravel and loosely compacted soil. Rabbitbrush (*Chrysothamnus spp*) and crested wheatgrass (*Agropyron cristatum*) comprise the dominant vegetation on the berm. The area surrounding the bermed pit is vegetated mainly by rabbitbrush and to a lesser extent by sagebrush (*Artemisia spp*), cheatgrass (*Bromus tectorum*), and other weedy species (e.g., Russian thistle). Large and apparently productive rabbitbrush shrubs were observed growing directly on the consolidated fly ash at the southeast side of the pit. Other areas of the fly ash pit other than the berm were devoid of vegetation. The area around the ash pit is generally disturbed and surrounded by a dirt/gravel road. A railroad spur is located to the north and runs parallel to the pit. An asphalt road (East Perimeter Road) bounds the western side of the pit area.

A site reconnaissance in November 1999 identified the presence of many burrowing mammals both on the berm as well as in the surrounding area. An unidentified species of small bird appeared to be ingesting gravel on a section of the fly ash pit that was covered with a gravel cap.

15.2 Previous Investigations

Results of analyses from 1985 through 1989 indicated that the majority of hazardous substances that were analyzed in the slurry were within surface soil background for the concentrations of the INEEL, as characterized in Appendix F of the Track 1 guidance document (DOE-ID 1992). Only Th-232 and chromium were expected to be present in the waste ash above known INEEL background, and both only slightly exceeded background concentrations. Other constituents for which risk was assessed either had no INEEL background concentration data against which they could be screened or had detection limits above INEEL background. In addition, there are other contaminants potentially associated with this process for which the waste ash has not been analyzed.

The ash produced in this process contains measurable quantities of radionuclides and metals originally present in the coal and limestone. In the past, waste pit ash was analyzed for the radionuclides U-238, Th-232, and K-40, as well as for metals. Concentrations of U-235 were estimated from its normal concentration relative to U-238. Inorganics of potential concern include beryllium, boron, chromium, fluoride, molybdenum, silver, strontium, and tin (DOE-ID 1993).

The WAG 3 ERA in OU 3-12 found CPP-66 to have HQs greater than 1.0 from estimated concentrations of boron, fluoride, selenium, and strontium. The OU 3-13 Final ROD (DOE-ID 1999) states that CPP-66 (Steam Fly Ash Pits) presents only a potential ecological risk and will be addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) OU 10-04, which focuses on INEEL-wide ecological risk concerns.

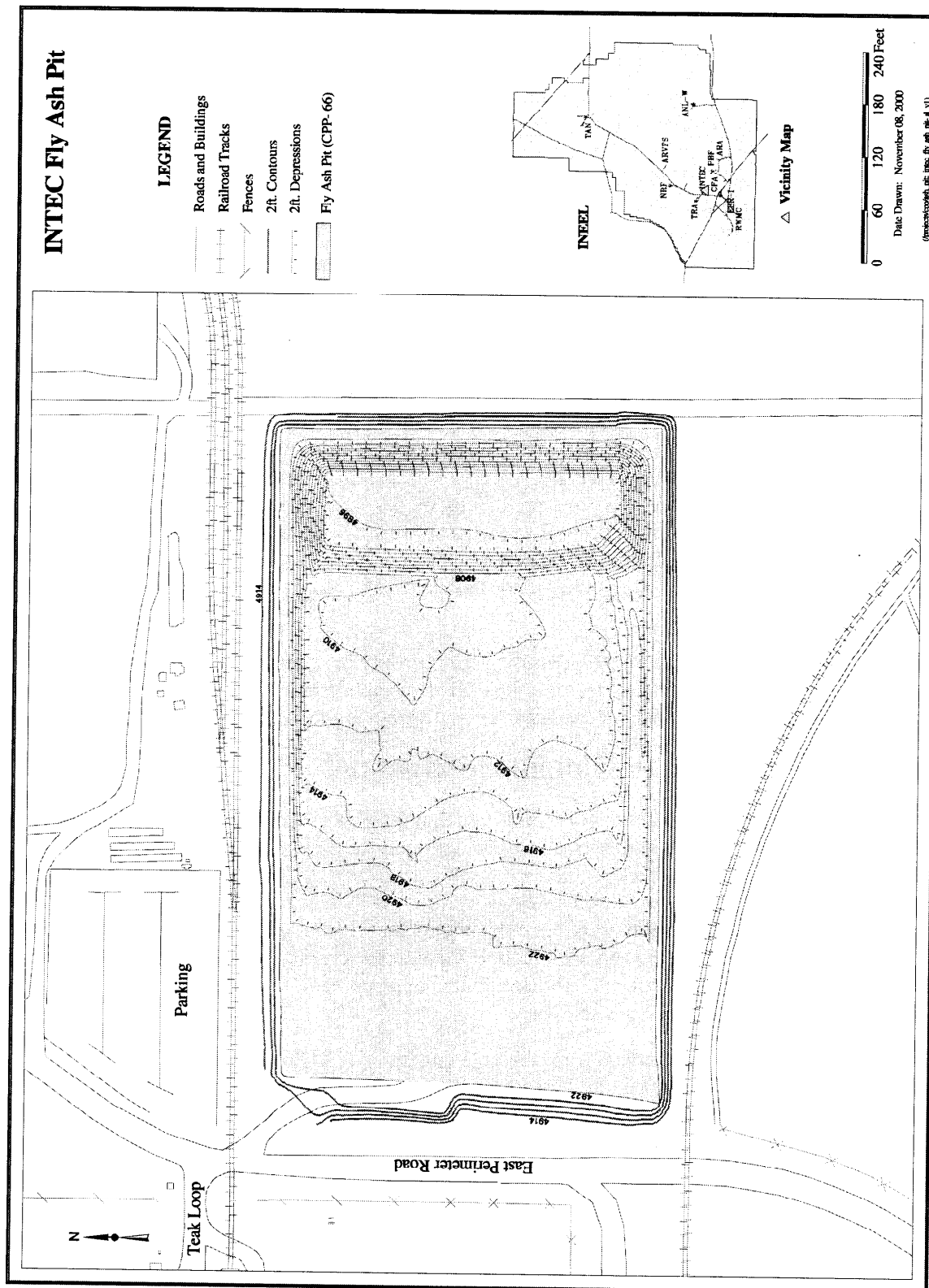


Figure 15-1. Location of Fly Ash Pit.

15.3 Nature and Extent of Contamination

The fly ash pit was sampled in 2000 to characterize the concentrations of metals. Sample results were limited to two depth intervals: 0 to 0.15m (0 to 0.5 ft) and 0.15 to 0.61 m (0.5 to 2ft). The data indicates that there are slightly elevated concentrations of metals associated with the fly ash. Copper and selenium were present in the fly ash in concentrations above INEEL background levels, and boron and strontium were included because their INEEL background levels have not yet been determined.

Data from previous investigations also indicate some radionuclide contamination at the site. However, the detected concentrations were only slightly above background.

15.4 Preliminary Screening

The soil data collected from the 2000 field sampling effort were screened for COPCs. The COPCs resulting from that screening are presented in Table 15-1. Complete screening results are contained in Appendix C. No COPCs were retained for the HHRA. Boron and copper were retained as COPCs for the ERA because the maximum concentrations exceeded the EBSLs. Selenium and strontium were retained as COPCs for the ERA because EBSLs have not yet been established for these contaminants.

15.5 Risk Assessment

Table 15-2 presents exposure point concentrations used in the ERA for this site, and both summary statistics and exposure point concentrations are contained in Appendix C.

15.5.1 Human Health

All COPCs were eliminated during the preliminary screening for human health. No contaminants were retained for the HHRA.

15.5.2 Ecological

The COPCs for the ERA are metals for the surface and subsurface soils. Rabbitbrush was observed growing on the consolidated fly ash without any visually apparent deleterious effects. Hazard Quotients (HQs) for boron, copper, selenium, and strontium ranged from 1 to 100. Only COPCs with HQs greater than 10 will be retained for further evaluation in the ERA. These HQs and COPCs are presented in Table 15-3. Any COPCs with HQs less than or equal to 10 are eliminated from the ERA because they pose a low risk to ecological receptors and no longer need to be evaluated.

The only COPC with an HQ less than 1 was selenium. Risks from these contaminants to reptiles, amphibians, and invertebrates could not be evaluated because of the lack of toxicity data to develop TRVs. Risks from exposure to birds and plants could not be evaluated for strontium.

The HQs for the COPCs at the fly ash pit are discussed below.

- The HQs for exposure to boron ranged from 2 for the pygmy rabbit (M122A) to 100 for plants (all vegetation). The EPC in the surface soil is 51.1 mg/kg and 32.8 mg/kg in the subsurface soil. The INEEL background value for boron has not been evaluated or made available at this time. All species except for plants have HQs that fall below the low risk HQ of 10. This group was modeled with a conservative PUF of 1.0, because a more realistic PUF has not yet been determined. It is not anticipated that this exposure will occur. The use

Table 15-1. Soil Contaminant Screening Process for the Fly Ash Pit (2000).

Detected Contaminants	Step 1		Step 2		Step 3		Step 4		Site COPC?
	Source Concentration (mg/kg)	INEEL Background Concentration (mg/kg)	Max Concentration > background?	Nontoxic Metal?	Region 9/3 RBC (mg/kg)	Max Concentration > RBC?	INEEL EBSL (mg/kg)	Max Concentration > EBSL?	
Boron	6.77E+01	NA	NA	No	5.50E+03	No	5.00E-01	Yes	No Yes
Copper	2.31E+01	2.20E+01	Yes	No	2.90E+03	No	2.11E+00	Yes	No Yes
Selenium	4.60E-01	2.20E-01	Yes	No	3.91E+02	No	No EBSL	No EBSL	No Yes
Strontium	2.00E+02	NA	NA	No	4.69E+04	No	No EBSL	No EBSL	No Yes

Source: WAG 10, OU 10-04 Database.

"NA" in Step 1 indicates that a background value is not available.

"No RBC" indicates that an EPA Region 9 or 3 risk-based concentration based on residential soil ingestion is not available.

"No EBSL" indicates that an INEEL ecologically based screening level is not available.

Arsenic was removed from the ERA and HHRA COPC lists because detected levels are within the arsenic regional background ranges discussed in Appendix K.

Table 15-2. Summary Exposure Point Concentrations for the Fly Ash Pit (concentration units are mg/kg; bin depths are in feet).

COPC	0–0.5 ft	0–4 ft	0–10 ft
Boron	5.11E+01	3.28E+01	1.31E+01
Copper	2.31E+01	2.18E+01	8.72E+00
Selenium	3.70E-01	3.00E-01	1.20E-01
Strontium	1.63E+02	9.45E+01	3.78E+01

Table 15-3. Summary of ERA HQs for the Fly Ash Pit.

COPCs	Boron	Copper	Strontium
Receptors	HQs	HQs	HQs
Deer mouse	—	5	6
Mule deer	—	—	1
Plants	100 ^a	—	—
Pygmy rabbit	2	3	10
Townsend's western big-eared bat	—	8	2

COPCs with HQs less than one are not presented in this table.

a. See the bulleted discussion on boron following this table as to why this HQ is not in bold or retained in the ERA.

of more realistic PUFs would likely reduce the HQs for these receptors. For this reason, it would be unlikely for boron to pose significant risk to plant receptors, and it will no longer be evaluated as a COPC.

- The HQs for exposure to copper ranged from 3 for the pygmy rabbit (M122A), and 5 for the deer mouse (M422), to 8 for the Townsend's western big-eared bat (M210A). The EPC in the surface soil is 23.1 mg/kg and 21.8 mg/kg in the subsurface soil. The INEEL background concentration for copper is 22 mg/kg. Therefore, an average species may be exposed to the same magnitude of risk from exposure to background. This contaminant was eliminated as a COPC, because the HQ fell below 10, which indicates a low risk to ecological receptors.
- Selenium HQs at the fly ash pit were all below 1.0.
- The HQs for exposure to strontium ranged from 1 for the mule deer (M122), 2 for the Townsend's western big-eared bat (M210A), and 6 for the deer mouse (M422), to 10 for the pygmy rabbit (M122A). The EPC in the surface soil is 163 mg/kg to 94.5 mg/kg in the subsurface soil. The INEEL background value for strontium has not been evaluated or made available at this time. This contaminant was eliminated as a COPC, because the HQs were equal to or below 10, which indicates a low risk to ecological receptors.

The risk evaluation indicates that the fly ash pit at CPP-66 has limited risk to ecological receptors from exposure to soils from this area. No COPCs were retained for further evaluation in the ERA for this site. Complete ERA results are presented in Appendix F.

15.5.3 Native American

The INEEL is within the aboriginal territories of the Shoshone-Bannock Tribes. A wide variety of natural and cultural resources and areas that directly reflect tribal cultural heritage and native landscape ecology are preserved there. These resources are important in maintaining tribal spiritual and cultural values and activities, oral tradition and history, mental and economic well being, and overall quality of life. Appendix A contains a qualitative analysis of WAG 6/10 prepared by the Tribal Risk Assessment Committee.

INTEC is located within an area that has revealed only limited evidence for prehistoric Native American use despite large-scale and intensive archaeological surveys. Even so, the area does contain plants and animals of general concern to the Tribes and is located in close proximity to the Big Lost River, whose intermittent waters are important. The tribal report (Appendix A) contains no specific mention of tribal risk associated with the INTEC Fly Ash Pit, and tribal members made no mention of specific concerns during a stop there on the March 2000 tribal tour. Low levels of contamination associated with the site may be of concern under the general framework of perceived risks that are described in the report. The ongoing monitoring and periodic reassessment planned for this site should ensure that risks do not exceed thresholds for human health and the environment and should also represent a first step toward addressing the general tribal concerns.

15.6 Uncertainties

Radionuclides were not analyzed for in the 2000 sampling activities, therefore, the site evaluation relied on previous characterization data. The potential for release of metal or radionuclide contamination from the fly ash pit into the environment is hindered due to the hardened nature of the fly ash-cement mixture that covers the soil layers below. The potential for contaminant migration to groundwater is uncertain because the actual depth to groundwater has not been established; however, this migration potential should be low because the fly ash-cement material is not highly soluble, therefore, COPCs are not significantly mobile. Furthermore, this site will be addressed according to a RCRA closure plan.

To limit the amount of information repeated in individual uncertainty sections, only the specific uncertainties associated with each site or area will be discussed within its section. General uncertainties associated with the HHRA are in Appendix D; general uncertainties associated with the ERA can be found in Appendix F.

15.7 Conclusions and Recommendations

No COPCs were retained for the HHRA. The 2000 field sampling activities indicate that this site does not pose risks to ecological receptors. Therefore, this site is recommended for no further action and will not be evaluated in the FS. However, it will be evaluated further in the INEEL-wide ecological risk concerns.

15.8 References

DOE-ID, 1999, *Final Record Of Decision (ROD)—Idaho Nuclear Technology & Engineering Center (INTEC) INEEL*, OPE-ER-119-99, August 1999.

DOE-ID, 1993, *Track 1 Investigation Of CPP-66, ICPP Coal Fired Steam Generation Facility (CFSGF) Ash Pit—No Further Action Determination*, 5688, April 1993.

DOE-ID, 1992, *Track 1 Sites: Guidance for Assessing Low Probability Sites at INEL*, DOE/ID-10340, July 1992.

CONTENTS

16.	WAG 10, OU 10-07, BURIED TELECOMMUNICATION CABLE	16-1
16.1	Site Description	16-1
16.2	Previous Investigations.....	16-1
16.3	Nature and Extent of Contamination.....	16-1
16.4	Preliminary Screening	16-1
16.5	Native American.....	16-1
16.6	Uncertainties.....	16-2
16.7	Conclusions and Recommendations.....	16-2
16.8	References	16-2

16. WAG 10, OU 10-07, BURIED TELECOMMUNICATION CABLE

16.1 Site Description

The U.S. West buried telecommunications cable was installed by AT&T in the early 1950s. The cable measures 58.7 km (36.5 mi) in length and is buried approximately 0.9 to 1.2 m (3 to 4 ft) bgs, parallel to and approximately 91 m (100 yd) east of Lincoln Boulevard at the INEEL. The telecommunications cable consists of copper wiring with paper insulation, enclosed by a lead sheathing approximately 1/8 in. thick. It is wrapped in spiraled steel and enclosed in jute wrapping impregnated with an asphalt-like substance (DOE-ID 1993). The cable originates at CFA and extends along Lincoln Boulevard to INTEC, TRA, the Naval Reactors Facility (NRF), and TAN. The cable was cut and rendered useless in the spring of 1990 when U.S. West installed a new fiber optic replacement cable. Soil samples collected in November 1990 indicated that no risk to human health or the environment was present, and the potential for release of contaminants from the cable in the future is expected to be very small. OU 10-07 is presently classified as a No Further Action site in the administrative record (DOE-ID 1999).

16.2 Previous Investigations

In 1990, nine soil samples, including a reference sample, were collected at the site at depths ranging from 2 to 2.8 m (6.5 to 9.3 ft) bgs. These samples were analyzed for lead because of the potential for the lead sheathing, which enclosed the cable, to degrade and release into the environment. The maximum value (10.6 mg/kg) was for the reference sample. The results and summary statistics for soils collected at this site are in Appendix C.

16.3 Nature and Extent of Contamination

Contamination does not appear to have been released into the environment as a result of the cut cable. All results for soil samples that were analyzed for lead were within the INEEL background. Because lead was not retained as a COPC, the site will not undergo further evaluation.

16.4 Preliminary Screening

The soil data collected from the 1990 field sampling effort were screened for COPCs. No further risk analysis was needed for this site, because lead was the only analyte considered and was not retained as a COPC for either the HHRA or the ERA. Preliminary screening results are presented in Appendix C. The HHRA and ERA screening methodology is discussed in Section 4 and presented in detail in Appendices D and F, respectively.

16.5 Native American

The INEEL is within the aboriginal territories of the Shoshone-Bannock Tribes. A wide variety of natural and cultural resources and areas that directly reflect tribal cultural heritage and native landscape ecology are preserved on the INEEL. These resources are important in maintaining tribal spiritual and cultural values and activities, oral tradition and history, mental and economic well-being, and overall quality of life. Appendix A contains a qualitative analysis of WAGs 6 and 10 prepared by the tribal Risk Assessment Committee. No specific mention of tribal risks associated with the telecommunications cable that is buried along Lincoln Blvd is contained within the report. Although the minimal contamination associated with this cable is stable and buried beneath the ground along a major roadway, it may still

represent a risk to the general resources listed in the report (land, air, water, animals, plants, tribal members).

16.6 Uncertainties

The construction of the cable limits the probability of the lead to become unconfined. Therefore, there is a low potential for release to the environment unless the cable is disturbed or otherwise impacted. Sampling results have shown that there is insignificant risk to human health or the environment.

16.7 Conclusions and Recommendations

The maximum lead concentration detected in the soil is 10.6 mg/kg, which is well below the INEEL background level for lead (17 mg/kg). There is insignificant risk associated with the buried cable in its present state. However, institutional controls are necessary in order to prevent damage to or disturbance of the cable. It is expected that the cable will not be removed but left in place indefinitely.

16.8 References

DOE-ID, April 1999, *Work Plan for Waste Area Groups 6 and 10 Operable Unit 10-04 Comprehensive Remedial Investigation/Feasibility Study*, DOE/ID-10554.

DOE-ID, 1993, *Track 1 Investigation of the U/S/ West Buried Telecommunications Cable*, Document #5737.